

Computer Science Department
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Research Interests

My area of research is Software Engineering with a focus on the design and development of architectures and infrastructures for self-adaptive software systems.

My research interests include self-adaptive systems, continuous software engineering, models at run-time and domain specific languages. I am currently working towards automated software evolution of cloud software applications through quality-driven continuous experimentation.

Education

2016-Present **Ph.D. Student in Computer Science** - University of Victoria, Canada

GPA 3.85/4

Advised by Drs. Hausi Müller and Gabriel Tamura

Thesis topic: Continuous software evolution at run-time

2014-2016 **M.Sc. in Software Engineering** - Universidad Icesi, Colombia

GPA 3.87/4

Advised by Dr. Gabriel Tamura

Thesis: A framework for generating and deploying dynamic performance monitors for self-adaptive software systems

2009-2014 **B.E. in Systems Engineering** - Universidad Icesi, Colombia

GPA 3.21/4 • Engineering Dean's list in semesters VI, VII, VIII and IX

Advised by Angela Villota-Gomez and Dr. Gabriel Tamura

Degree project: PaSCAni: A language for run-time V&V of functional requirements (Spanish)

Selected Awards and Honors

2018, 2019 **Travel Scholarship**, CRA-URMD Grad Cohort

2017-2019 **UVic Graduate Award (3 times)**, University of Victoria

2017 **Howard E. Petch Research Scholarship**, University of Victoria

2017-2019 **IBM Advanced Studies Grant**, IBM

2016 **Doctoral Fellowship (full academic scholarship)**, University of Victoria

2014 **Master's Fellowship (full academic scholarship)**, Universidad Icesi

2014 **Student Loan Forgiveness**, Colombian Institute of Educational Credit and Technical Studies

2013 **Top ECAES Exam**, Colombian Institute for the Promotion of Higher Education

2009 **Undergraduate Scholarship (25%)**, Universidad Icesi

2011-2014 **Engineering Dean's list in semesters VI, VII, VIII, & IX**, Universidad Icesi

¹This curriculum vitae was last updated on April 12, 2019. Download the latest version from migueljimenez.co/cv.pdf

Publications

Refereed Journal Articles

- [J.1] Hugo Arboleda, Andrés Paz, **Miguel Jiménez**, and Gabriel Tamura. “[Development and Instrumentation of a Framework for the Generation and Management of Self-Adaptive Enterprise Applications](#)”. en. In: *Ingeniería y Universidad* 20 (Dec. 2016), pp. 303–333. *Rank: Q3 SJR: 0.161*.

Refereed Conference Proceedings

- [C.1] **Miguel Jiménez**, Luis F. Rivera, Norha M. Villegas, Gabriel Tamura, Hausi A. Müller, and Nelly Bencomo. “Software Engineering at Run-time”. In: (Unpublished) To be submitted to ASE 2019.
- [C.2] Luis F. Rivera, Norha M. Villegas, Gabriel Tamura, **Miguel Jiménez**, and Hausi A. Müller. “[UML-driven Automated Software Deployment](#)”. In: *Proceedings of the 28th Annual International Conference on Computer Science and Software Engineering (CASCON)*. IBM, 2018, pp. 257–268. *Rank: B1 (Qualis) Acceptance rate: 27%*.
- [C.3] Prashanti Angara, **Miguel Jiménez**, Kirti Agarwal, Harshit Jain, Roshni Jain, Ulrike Stege, Sudhakar Ganti, Hausi A. Müller, and Joanna W. Ng. “[Foodie Fooderson a Conversational Agent for the Smart Kitchen](#)”. In: *Proceedings of the 27th Annual International Conference on Computer Science and Software Engineering (CASCON)*. IBM, 2017, pp. 247–253. *Rank: B1 (Qualis) Acceptance rate: 27%*.
- [C.4] **Miguel Jiménez**, Norha M. Villegas, Gabriel Tamura, and Hausi A. Müller. “[Deployment Specification Challenges in the Context of Large Scale Systems](#)”. In: *Proceedings of the 27th Annual International Conference on Computer Science and Software Engineering (CASCON)*. IBM, 2017, pp. 220–226. *Rank: B1 (Qualis) Acceptance rate: 27%*.
- [C.5] Hugo Arboleda, Andrés Paz, **Miguel Jiménez**, and Gabriel Tamura. “[A framework for the generation and management of self-adaptive enterprise applications](#)”. In: *2015 10th Computing Colombian Conference (10CCC)*. 2015, pp. 55–62. *SJR: 0.114*.

Refereed Workshop Proceedings

- [W.1] Jean-Michel Bruel and **Miguel Jiménez**. “[DevOps’18 Education Panel](#)”. In: *Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment*. Ed. by Jean-Michel Bruel, Manuel Mazzara, and Bertrand Meyer. Springer, 2019, pp. 221–226.
- [W.2] **Miguel Jiménez**, Lorena Castaneda, Norha M. Villegas, Gabriel Tamura, Hausi A. Müller, and Joe Wigglesworth. “[DevOps Round-Trip Engineering: Traceability from Dev to Ops and Back Again](#)”. In: *Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment*. Ed. by Jean-Michel Bruel, Manuel Mazzara, and Bertrand Meyer. Springer, 2019, pp. 73–88.
- [W.3] **Miguel Jiménez**, Luis F. Rivera, Norha M. Villegas, Gabriel Tamura, Hausi A. Müller, and Nelly Bencomo. “An Architectural Framework for Quality-driven Adaptive Continuous Experimentation”. In: *Proceedings of the IEEE/ACM Joint 4th International Workshop on Rapid Continuous Software Engineering and 1st International Workshop on Data-Driven Decisions, Experimentation and Evolution (RCoSE/DDrEE)*. In press. 2019.
- [W.4] **Miguel Jiménez**, Luis F. Rivera, Norha M. Villegas, Gabriel Tamura, Hausi A. Müller, and Pilar Gallego. “[DevOps’ Shift-Left in Practice: An Industrial Case of Application](#)”. In: *Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment*. Ed. by Jean-Michel Bruel, Manuel Mazzara, and Bertrand Meyer. Springer, 2019, pp. 205–220.
- [W.5] **Miguel A. Jiménez**, Ángela V. Gómez, Norha M. Villegas, Gabriel Tamura, and Laurence Duchien. “[A Framework for Automated and Composable Testing of Component-Based Services](#)”. In: *2014 IEEE 8th International Symposium on the Maintenance and Evolution of Service-Oriented and Cloud-Based Systems (MESOCA)*. 2014, pp. 1–10.

Selected Posters and Contributed Talks

- [P.1] **Miguel Jiménez**, Gabriel Tamura, and Hausi Müller. *Towards Software Engineering at Run-time Through Continuous Experimentation and Evolution*. Poster at 2019 CRA Grad Cohort Workshop for Underrepresented Minorities + Persons with Disabilities (CRA URMD), Waikoloa Village, Hawaii, United States. Mar. 2019.
- [P.2] **Miguel Jiménez**, Gabriel Tamura, and Hausi Müller. *Continuous Deployment Specification for Large-Scale Systems*. Poster at the 28th Annual International Conference on Computer Science and Software Engineering (CASCON), Markham, ON, Canada. Oct. 2018.
- [P.3] **Miguel Jiménez**, Norha M. Villegas, Gabriel Tamura, and Hausi Müller. *Round-trip Software Engineering in DevOps: Making the Infrastructure a Code Committer*. Poster at 2018 CRA Grad Cohort Workshop for Underrepresented Minorities + Persons with Disabilities (CRA URMD), San Diego, California, United States. Mar. 2018.
- [P.4] **Miguel Jiménez**, Norha M. Villegas, Gabriel Tamura, Hausi Müller, Joe Wigglesworth, and Ian Watts. *DevOps Round-trip Software Engineering: On Traceability from Dev to Ops and back*. Talk at the Consortium for Software Engineering Research (CSER), Markham, ON, Canada. May 2018.
- [P.5] **Miguel Jiménez**, Prashanti Angara, Harshit Jain, Kirti Agarwal, Roshni Jain, Hausi Müller, Ulrike Stege, and Joanna Ng. *Cognitive IoT Recipe Maven: Digital Expertise in the Kitchen*. Poster at Centre for Advanced Studies Technical Link Event (CASTLE), Markham, ON, Canada. May 2017.
- [P.6] **Miguel Jiménez**, Hausi Müller, and Gabriel Tamura. *A DSL Approach For Dynamic Performance Monitoring and Deployment*. Petcha Kutcha presentation at the Consortium for Software Engineering Research (CSER), Markham, ON, Canada. Oct. 2016.
- [P.7] **Miguel Jiménez**, Hausi Müller, and Gabriel Tamura. *A DSL Approach For Generating and Deploying Dynamic Performance Monitors for Self-Adaptive Software Systems*. Poster at the 26th Annual International Conference on Computer Science and Software Engineering (CASCON), Markham, ON, Canada. Oct. 2016.

Invited Talks

- [T.1] **Miguel Jiménez**. *Continuous Value Delivery with DevOps (Spanish)*. Online webinar for university alumni, Universidad Icesi. Mar. 2019.
- [T.2] **Miguel Jiménez**, Gabriel Tamura, and Hausi Müller. *Towards Continuous Assurance of Non-Functional Requirements Through Continuous Experimentation*. Presentation at the [2nd Workshop on DevOps and Software Analytics for Continuous Engineering and Improvement](#), Annual International Conference on Computer Science and Software Engineering (CASCON). Markham, Canada. Nov. 2018.

Research Experience

- Jan 2018 - Present **Project Lead Student**
IBM Advanced Studies + Rigi Research Group, University of Victoria, Canada
Advised by Joe Wigglesworth (IBM), Dr. Hausi Müller and Dr. Gabriel Tamura

Conduct research and collaborate with the team behind IBM Cloud Automation Manager to develop round-trip engineering mechanisms for infrastructure as code, and automate continuous experimentation for deployments on the cloud.
- Jan 2014 - Aug 2016 **Graduate Research Assistant**
i2T/DRISO Research Group, Universidad Icesi, Colombia
Advised by Dr. Gabriel Tamura
 - Identified challenges in dynamic performance monitoring of self-adaptive systems and proposed technical solutions following the SOA philosophy to advance the state of the art
 - Designed and implemented two domain-specific languages for dynamic monitoring and distributed deployment
 - Managed the computing resources of the i2T/DRISO research group's computing grid (15 physical machines)

- Jun 2013 - **Research Assistant Intern**
 Dec 2013 i2T/DRISO Research Group, Universidad Icesi, Colombia
Advised by Dr. Gabriel Tamura
 Implemented and conducted quantitative experiments for the matrix multiplication problem.
- Jan 2012 - **Undergraduate Research Assistant**
 May 2012 i2T/DRISO Research Group, Universidad Icesi, Colombia
Advised by Lorena Castaneda
 Learned about Service Component Architecture and migrated a MAPEK loop implementation from Apache Tuscany to FraSCAti.

Industry Collaborative Projects

- 2018 - **Reverse Engineering Deployment Specifications from Running Systems**
 Present CAS Fellowship Project - IBM + University of Victoria, Canada
Role: Lead Student
Joe Wigglesworth (Lead Contributor), Hausi Müller (Principal Investigator)
 The objective of this project is threefold. First, design reverse engineering techniques to introspect deployed infrastructures; second, generate the representative Terraform templates of a deployed infrastructure; and third, design a mechanism to automatically maintain the correspondence between the infrastructure and the deployment templates.
- 2017 **Cognitive IoT Recipe Maven**
 CAS Fellowship Project - IBM + University of Victoria, Canada
Role: Lead Student
Joanna Ng (Lead Contributor), Hausi Müller (Principal Investigator)
 Goal: to develop software applications to exploit digital expertise in the modern kitchen based on integrated user, fridge and grocery store contexts, including smart fridge, grocery store incentives, personal health goals, dietary constraints, cultural backgrounds and family budget. **I worked on** the design and development of a conversational agent for the smart kitchen.
- 2015 - **Context-Driven Route Optimization: A Home-Health Case**
 2016 Technological Innovation Project - Colciencias + Carvajal T&S, Colombia
Role: Young Researcher
Diana Gonzalez and Oscar Mancipe (Lead Contributors), Gabriel Tamura (Principal Investigator)
 Goal: To optimize the route planning of a management software for home health. The solution was an adaptation to the asymmetric traveling salesman problem with time windows. **I worked on** maps, generator of test cases.
- 2014 - **Processing of Large and Complex XML Documents**
 2015 Technological Innovation Project - Colciencias + Carvajal T&S, Colombia
Role: Young Researcher
Pilar Gallego (Lead Contributor), Gabriel Tamura (Principal Investigator)
 Goal: to improve a reference architecture of a product family for the processing of large data volumes. **I worked on** automating the monitoring, configuration and deployment of controlled experiments.

Teaching and Mentoring Experience

- Spring 2018 **Graduate Teaching Assistant**
 Assistance Centre in Computer Science, University of Victoria
 Tutored students and assisted them with programming assignments in one-on-one sessions.
- 2016-2018 **Lead Graduate Teaching Assistant**
 Fundamentals of Programming with Engineering Applications (CSC 111), University of Victoria
 Instructor: Dr. Hausi Müller

- Lectured weekly labs and assisted students with programming and lab assignments
- Co-led weekly meetings and developed teaching material and quizzes
- Developed [grade-buddy](#), a program to assist teaching assistants and professors in automating the marking of programming assignments
- Developed a [multi-platform installation assistant](#) to ease the installation of CLion and its dependencies on Windows, Mac and Linux
- Developed [examgen](#), a program to generate examinations along with their solutions from a YAML input file. The resulting files are rendered to either \LaTeX or Moodle. By creating examgen, we stopped printing **2800** quizzes and reduced marking time by **30h** per term
- Deployed and managed an online platform to host and mark programming assignments

Fall 2016	<p><i>Graduate Teaching Assistant</i> Data Structures I (CSC 225), University of Victoria Instructor: Dr. Ulrike Stege Lectured weekly labs, developed scripts to automate marking and graded assignments.</p>
2015	<p><i>Technical Advisor</i> Undergraduate degree project, Interactive Media Design Program - Universidad Icesi Project: Knowledge management and dissemination: alternative soccer culture Student: Juan David Flórez Bautista</p>
2014	<p><i>Tutor</i> Undergraduate degree project, Interactive Media Design Program - Universidad Icesi Project: Folii: natural and interactive encyclopedia mediated by citizen science Students: Juan Pablo Pérez, Mauricio Alberto Toro</p>
2014-2015	<p><i>Co-Tutor</i> Undergraduate degree project, Interactive Media Design Program - Universidad Icesi Project: An information system for bicycle transportation Student: Claudia Ximena Barriga</p>
Spring 2011	<p><i>Teaching Assistant</i> Data Structures and Algorithms, Universidad Icesi Instructor: Angela Villota-Gomez Graded assignments and assisted students during weekly labs.</p>

Service and Volunteering

2011-2012	<p><i>Volunteer instructor for the Web Programming Club</i> Universidad Icesi, Cali, Colombia Developed teaching material and lectured members of the programming club on HTML, CSS and JavaScript.</p>
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Skills

I have been developing software applications for the past five years. My experience in the industry includes the following freelance development work:

- Online auction application for LaFrancol laboratories (now Abbott)
- Management web application to support the purchasing department of Carvajal Espacios
- Corporate websites and supporting sites (e.g., tutorials & tickets) for small Colombian companies, including SQL Soluciones Informáticas, Ecohotel el Castillo, Juan Felipe Velez Accountant and Z-Graphics

The following is a list of selected skills. You can find more information about my practical knowledge in my Github profile (github.com/jachinte).

■ **Programming Languages**

Java, Xtend
JavaScript, CSS, HTML
C
Python
Go
C#
Oz
ShellScript

■ **Technical Skills**

Architecture Design
Build Automation
Software Deployment
Containerized Applications
Continuous Delivery
Data mining (basic)
Infrastructure Provision
Language Engineering
Object Oriented Programming
Performance Monitoring
Service Component Architecture

■ **Languages**

Spanish (Native)
English (Fluent)
French (Elementary)

Selected References

Dr. Hausi Müller

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Computer Science Department, University of Victoria
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Dr. Gabriel Tamura

Associate Professor
Department of ICT, Universidad Icesi
Email: gtamura@icesi.edu.co

Dr. Lorena Castaneda

Software Developer
CityView
Email: lcastane@gmail.com

Dr. Norha M. Villegas

Director of the Software Systems Engineering Professional Program
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